How to create a Banana Beat Box with Raspberry Pi
Carrie Anne Philbin

Award Winning Educator, Author & YouTuber

Education Pioneer
Raspberry Pi Foundation

@MissPhilbin
@GeekGurlDiaries
Adventures in Raspberry Pi

Second Edition

Carrie Anne Philbin

Get busy with your Raspberry Pi!

Guide yourself through the complex activities of programming to create these amazing projects!

WILEY
What you will need
Explorer HAT Pro

- mini breadboard
- capacitive touch buttons
- slots for inputs like motors
- LEDs
- buttons

To program this with Python, you need to install the Python 3 explorer hat library from Pimoroni.
Connect and boot your Pi

The explorer HAT fits onto the GPIO pins of a Raspberry Pi
Log in

login: pi
password: raspberry

pi@raspberrypi ~ $ startx
Opening IDLE 3 as SUDO

pi@raspberrypi ~ $ cd musicbox
pi@raspberrypi ~ $ touch musicbox.py
pi@raspberrypi ~ $ sudo idle3 musicbox.py &
you can type commands directly into the interpreter window

To write longer programs open a text editor window
```python
import explorerhat
import time

eplorerhat.light.on()
time.sleep(1)
eplorerhat.light.off()
```
Hello World with LEDs

```python
import explorerhat
import time

explorerhat.light.on()
print("lights on")
time.sleep(1)
explorerhat.light.off()
print("lights off")
```

Using print statements is a good way to troubleshoot any problems in the code.
Sequencing with LEDs

import explorerhat
import time

explorerhat.light.yellow.on()
print("yellow light on")
time.sleep(1)
explorerhat.light.yellow.off()
print("yellow light off")

Can you finish this code to sequence traffic lights?
Using buttons

```python
import explorerhat
import time

def traffic(channel, event):
    explorerhat.light.yellow.on()
    print("yellow light on")
    time.sleep(1)
    explorerhat.light.yellow.off()
    ...

explorerhat.touch.one.pressed(traffic)
```
Challenge 1

- Can you write a function for buttons 1 - 4 that turn on one colour LED when you press the button?

  e.g.

  - button 1 turns on the blue LED for 1 second
  - button 2 turns on the red LED for 1 second
  - ...

Adding Sounds

```python
import pygame

pygame.mixer.init()

bell = pygame.mixer.Sound("samples/elec_bell.wav")

def ping(channel, event):
    print("button 5 pressed")
    bell.play()
    explorerhat.light.blink(1, 1)
    time.sleep(1)
    explorerhat.light.off()

explorerhat.touch.five.pressed(ping)
```

capital letters are important in Python

make sure you save this file in the music box folder
Challenge 2

Can you add a different sound to each of your button functions so far?

e.g.

- button 1 turns on the blue LED for 1 second and plays a drum sound.
- If you use buttons 5 - 8 you can use capacitive touch and add banana buttons!
What you will need for banana buttons
Connect to buttons 5 - 8
Find more free resources
Carrie Anne Philbin

Award Winning Educator, Author & YouTuber

Education Pioneer
Raspberry Pi Foundation

@MissPhilbin
@GeekGurlDiaries